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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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Yuji Nishida

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MANELLI DENISON & SELTER
2000 M STREET NW SUITE 700
WASHINGTON, DC 20036-3307

EXAMINER

STULII, VERA

ART UNIT

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/534,104	Applicant(s) NISHIDA ET AL.	
	Examiner VERA STULII	Art Unit 1794	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 02 February 2009.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-26 and 28-33 is/are pending in the application.
- 4a) Of the above claim(s) 27 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-26 and 28-33 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>02/11/2008, 06/13/2006, 05/06/2005</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Election/Restrictions

Applicant's election without traverse of invention of group I, claims 1-26 and 28-33 in the reply filed on February 2, 2009 is acknowledged.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1-26 and 28-33 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The terms "less sulfur smell" in claims 1, 2, 5, 6, 8, 17 and "less diacetyl smell" in claims 9, 15, 16, 17 are relative terms that render the claim indefinite. The terms "less sulfur smell " and "less diacetyl smell" are not defined by the claims, the specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 9-10 are rejected under 35 U.S.C. 102(b) as being anticipated by Nakanishi et al (US 4,698,224).

In regard to claims 9-10, Nakanishi et al discloses a method for producing fermented beverages (beers) having reduced diacetyl smell by stopping second fermentation when free amino nitrogen level reaches predetermined level (free amino nitrogen level is being controlled) (Col. 1 lines 5-10; Col. 6 lines 5-15, Col. 12 lines 55-63, Example III-I, Table III-1).

In regard to claims 9-10, Nakanishi et al discloses the free amino nitrogen level in wort during the fermentation is 14.5 mg/100 ml (Table III-1).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

Claims 1-8, 21-26 and 32-33 are rejected under 35 U.S.C. 103(a) as being unpatentable over Jangaard et al in view of Applicants' admission of the prior art.

In regard to claim 1, Jangaard et al disclose a method for production of fermented beverage (beer) with no hydrogen sulfide that produces sulfur smell in beer, wherein L-methionine is added to the wort (page 46; Tables I, II; page 48 left column §1). Jangaard et al is silent as to the production of beer by fermentation stopping process. As admitted by applicants, the fermentation stopping method was well known in the art as a method of manufacturing beer with low-alcohol content (Page 3 § 2 of Specification). Since Jangaard et al disclose production of beer in general (without specifying alcohol content), one of ordinary skill in the art would have been motivated to employ teachings of Jangaard et al in the production of low-alcoholic beer through fermentation stopping in order to avoid production of the sulfur smell. Further in this regard, it is noted that, as admitted by applicants, it is a common concern among fermented beverages to prevent off-flavors from developing during a yeast-based fermentation step" (Page 2 § 2 of Specification). Therefore, since Jangaard discloses elimination of sulfur smell during the fermentation step in production of beer in general, regardless the alcohol content, and Applicants admits the common problem of elimination of off-flavors and smells during fermentation of wort in when the method of stopping fermentation employed, one of ordinary skill in the art would have been motivated to employ teachings of Jangaard et al in the production of low-alcoholic beer by fermentation stopping process in order to avoid production of sulfur smell as taught by Jangaard et al. One of ordinary skill in the art would have been motivated to do so,

Art Unit: 1794

since the problem of sulfur smell production and the solution of adding L-methionine to the wort was taught by Jangaard et al. One of ordinary skill in the art would have been further motivated to include additional step of addition of L-methionine to the wort in stopping fermentation process in order to avoid the common problem of sulfur smell development during fermentation step. One of ordinary skill in the art would have been further motivated to do so, since addition of L-methionine to the wort reduces production of hydrogen sulfide, and eliminated sulfur smell which significantly improves the taste, aroma, marketability and consumer satisfaction of the final beer beverage.

In regard to claim 2, Jangaard et al disclose the concentration of L-methionine in the wort is 2-10mM (Table I).

In regard to claims 3 and 4, Jangaard et al disclose production of beer, and thus discloses that wort is prepared from malt (barley malt is the main source of starch in the beer wort production).

In regard to claims 5 and 6, Jangaard et al disclose that L-methionine has inhibiting effect on hydrogen sulfide production, and that the minimal effective concentration is 1 mM (Table II). Jangaard et al further disclose that the concentration of L-methionine normally found in wort is 0.26mM. Jangaard et al further disclose adding 2-10 mM of L-methionine to the wort in order to avoid production of hydrogen sulfide, and therefore eliminate sulfur smell. Thus, Jangaard et al disclose preventing L-methionine depletion during fermentation by adding L-methionine to the wort and maintaining L-methionine concentration above the minimal effective concentration of 1 mM (Table II).

In regard to claims 7, 8 and 21-22 as stated above in regard to claim 1, Jangaard et al is silent as to the production of beer by fermentation stopping process. In any case, fermentation stopping method is a traditional fermentation method where the fermentation is stopped early when the desired content of alcohol is produced. Therefore, in regard to claim 7, one of ordinary skill in the art would have been motivated to stop fermentation when the desired level of alcohol in beer has been achieved. One of ordinary skill in the art would have been motivated to do so, since production of low-alcoholic beers by fermentation stopping process was well known in the art as admitted by applicant (see also rejection of claim 1).

In regard to claim 8, Jangaard et al disclose that L-methionine has an inhibiting effect on hydrogen sulfide production, and that the minimal effective concentration is 1 mM (Table II). Jangaard et al further disclose that the concentration of L-methionine normally found in wort is 0.26mM. Jangaard et al further disclose adding 2-10 mM of L-methionine to the wort in order to avoid production of hydrogen sulfide, and therefore eliminate sulfur smell. Thus, Jangaard et al disclose preventing L-methionine depletion during fermentation by adding L-methionine to the wort and maintaining L-methionine concentration above the minimal effective concentration of 1 mM (Table II).

In regard to claims 23-26 and 32-33, it is noted that *Saccharomyces cerevisiae* was well known to be used in the beer production. Therefore, one of ordinary skill in the art would have been motivated to use *Saccharomyces cerevisiae* as appropriate yeast strain.

Claims 11-13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nakanishi et al (US 4,698,224) as applied to claims 9-10 above, and further in view of Pugh et al.

In regard to claim 11, Nakanishi et al is silent as to adjusting the L-valine concentration. Pugh et al discloses that valine can be used as a marker to optimize the wort free amino nitrogen" (page 188 left column §2). Pugh also discloses effect of free amino nitrogen concentration on diacetyl production. Since both Nakanishi et al and Pugh et al are concerned with diacetyl production, one of ordinary skill in the art would have been motivated to modify Nakanishi et al and to employ valine as a marker to optimize the wort free amino nitrogen as taught by Pugh et al (page 188 left column §2). One of ordinary skill in the art would have been motivated to so, since both Nakanishi et al and Pugh et al disclose reduction of diacetyl smell by controlling free amino nitrogen level in beer wort.

In regard to claim 12, Nakanishi et al does not disclose controlling free amino nitrogen level by adjusting parameters as recited in claim 12. In regard to claim 12, Pugh et al discloses free amino nitrogen level is derived from malt and is effected by malt/adjunct ratio, mashing schedule, barley variety and malting conditions (Page 185 left column §2). Further, Pugh discloses adjusting free amino nitrogen level by dilution (page 186 column 2 § 1). Since Nakanishi et al discloses adjusting free amino nitrogen level, and Pugh et al discloses free amino nitrogen level is effected by malt/adjunct ratio, mashing schedule, barley variety, malting conditions and dilution factor, one of

ordinary skill in the art would have been motivated to modify Nakanishi et al and to employ dilution factor as taught by Pugh in order to adjust free amino nitrogen level.

In regard to claim 13, Nakanishi et al discloses production of beer, and thus discloses that wort is prepared from malt (barley malt is the main source of starch in the beer wort production).

Claims 14-16, 23- 26, 28, 30 and 32-33 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nakanishi et al (US 4,698,224) in view of Applicants' admission of the prior art.

In regard to claims 14-16, 28 and 30, Nakanishi et al is silent as to the production of low-alcoholic beers and particular alcohol content of beer. As admitted by applicants, the fermentation stopping method was well known in the art as a method of manufacturing beer with low-alcohol content. Nakanishi et al disclose production of beer with reduced diacetyl smell, and as admitted by applicants, it is a common concern to prevent off-flavors from developing during a yeast-based fermentation step" (Page 2 § 2 of Specification). Therefore, since Nakanishi et al discloses elimination of diacetyl smell during the fermentation step in production of beer in general, regardless the alcohol content, and Applicants admits the common problem of elimination of off-flavors and smells during fermentation of wort in when the method of stopping fermentation employed, one of ordinary skill in the art would have been motivated to employ teachings of Nakanishi et al in the production of low-alcoholic beer by the fermentation stopping process in order to avoid production of diacetyl smell as taught by Nakanishi et al. One of ordinary skill in the art would have been motivated to stop fermentation when

the desired level of alcohol in beer has been achieved. One of ordinary skill in the art would have been motivated to do so, since production of low-alcoholic beers by fermentation stopping process was well known in the art as admitted by applicant (see also rejection of claim 1).

In regard to claims 15 and 16, Nakanishi et al disclose the final free amino nitrogen level of 5.6 mg/ml (Example III-1; Table III-1).

In regard to claims 23-26 and 32-33, it is noted that *Saccharomyces cerevisiae* was well known to be used in the beer production. Therefore, one of ordinary skill in the art would have been motivated to use *Saccharomyces cerevisiae* as appropriate yeast strain.

Claims 17, 23-26, 29 and 31-33 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ramos-Jeunehomme in view of Applicants' admission of the prior art.

In regard to claim 17, Ramos-Jeunehomme discloses that the presence of methionine diminishes production of hydrogen sulfide during wort fermentation, and the presence of valine, isoleucine or leucine to inhibit the formation of vicinal diketones. Thus, Ramos-Jeunehomme discloses controlling free amino nitrogen level in order to reduce diacetyl smell during the wort fermentation.

Ramos-Jeunehomme is silent as to the production of beer by fermentation stopping process. As admitted by applicants, the fermentation stopping method was well known in the art as a method of manufacturing beer with low-alcohol content (Page

Art Unit: 1794

3 § 2 of Specification). Ramos-Jeunehomme discloses production of beer in general (without specifying alcohol content), one of ordinary skill in the art would have been motivated to employ teachings of Ramos-Jeunehomme in the production of low-alcoholic beer through fermentation stopping in order to avoid production of the sulfur and diacetyl smell. Further in this regard, it is noted that, as admitted by applicants, it is a common concern to prevent off-flavors from developing during a yeast-based fermentation step” (Page 2 § 2 of Specification). Therefore, since Ramos-Jeunehomme discloses elimination of sulfur and diacetyl smell during the fermentation step in production of beer in general, regardless the alcohol content, and Applicants admits the common problem of elimination of off-flavors and smells during fermentation of wort in when the method of stopping fermentation employed, one of ordinary skill in the art would have been motivated to employ teachings of Ramos-Jeunehomme in the production of low-alcoholic beer by fermentation stopping process in order to avoid production of sulfur and diacetyl smell as taught by Ramos-Jeunehomme. One of ordinary skill in the art would have been further motivated to do so, since elimination of sulfur and diacetyl smell significantly improves the taste, aroma, marketability and consumer satisfaction of the final beer beverage.

In regard to claims 23-26 and 32-33, it is noted that *Saccharomyces cerevisiae* was well known to be used in the beer production. Therefore, one of ordinary skill in the art would have been motivated to use *Saccharomyces cerevisiae* as appropriate yeast strain.

Claim 18 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ramos-Jeunehomme in view of Jangaard et al, Nakanishi et al (US 4,698,224) and Applicants' admission of the prior art.

Ramos-Jeunehomme does not disclose L-methionine concentration and free amino nitrogen level as recited. As stated above, Jangaard et al disclose a method for production of fermented beverage (beer) with no hydrogen sulfide that produces sulfur smell in beer, wherein L-methionine is added to the wort (page 46; Tables I, II; page 48 left column §1). As stated above, Nakanishi et al discloses a method for producing fermented beverages (beers) having reduced diacetyl smell by stopping second fermentation when free amino nitrogen level reaches predetermined level (free amino nitrogen level is being controlled) (Col. 1 lines 5-10; Col. 6 lines 5-15, Col. 12 lines 55-63, Example III-I, Table III-1). Since Ramos-Jeunehomme discloses controlling of methionine concentration in wort to reduce production of hydrogen sulfide during wort fermentation, and controlling free amino nitrogen level in order to reduce diacetyl smell during the wort fermentation, and Jangaard et al and Nakanishi et al disclose the same problem and solution of reduction of sulfur and diacetyl smells accordingly, one of ordinary skill in the art would have been motivated to modify Ramos-Jeunehomme and to incorporate teachings of Jangaard et al and Nakanishi et al regarding specific ranges of inhibitory concentrations as recited.

In regard to claim 18, Jangaard et al disclose that L-methionine has inhibiting effect on hydrogen sulfide production, and that the minimal effective concentration is 1 mM (Table II). Jangaard et al further disclose that the concentration of L-methionine

normally found in wort is 0.26mM. Jangaard et al further disclose adding 2-10 mM of L-methionine to the wort in order to avoid production of hydrogen sulfide, and therefore eliminate sulfur smell. Thus, Jangaard et al disclose preventing L-methionine depletion during fermentation by adding L-methionine to the wort and maintaining L-methionine concentration above the minimal effective concentration of 1 mM (Table II). In regard to claim 18, Nakanishi et al discloses the free amino nitrogen level in wort during the fermentation is 14.5 mg/100 ml (Table III-1).

Claims 19 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ramos-Jeunehomme in view of Jangaard et al, Nakanishi et al (US 4,698,224), Applicants' admission of the prior art and further in view of Pugh et al.

In regard to claim 19, Ramos-Jeunehomme, Jangaard et al, Nakanishi et al are silent as to adjusting the L-valine concentration. Pugh et al discloses that valine can be used as a marker to optimize the wort free amino nitrogen" (page 188 left column §2). Pugh also discloses effect of free amino nitrogen concentration on diacetyl production. Since Ramos-Jeunehomme, Nakanishi et al and Pugh et al are concerned with diacetyl production, one of ordinary skill in the art would have been motivated to modify combination of teachings of Ramos-Jeunehomme and Nakanishi et al and to employ valine as a marker to optimize the wort free amino nitrogen as taught by Pugh et al (page 188 left column §2). One of ordinary skill in the art would have been motivated to so , since Ramos-Jeunehomme, Nakanishi et al and Pugh disclose reduction of diacetyl smell by controlling free amino nitrogen level in beer wort.

In regard to claim 20, Nakanishi et al does not disclose controlling free amino nitrogen level by adjusting parameters as recited in claim 20. In regard to claim 20, Pugh et al discloses free amino nitrogen level is derived from malt and is effected by malt/adjunct ratio, mashing schedule, barley variety and malting conditions (Page 185 left column §2). Further, Pugh discloses adjusting free amino nitrogen level by dilution (page 186 column 2 § 1). Since Nakanishi et al discloses adjusting free amino nitrogen level, and Pugh et al discloses free amino nitrogen level is effected by malt/adjunct ratio, mashing schedule, barley variety, malting conditions and dilution factor, one of ordinary skill in the art would have been motivated to modify combination of teachings of Ramos-Jeunehomme and Nakanishi and to employ dilution factor as taught by Pugh in order to adjust free amino nitrogen level.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to VERA STULII whose telephone number is (571)272-3221. The examiner can normally be reached on 7:00 am-3:30 pm, Monday-Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Keith Hendricks can be reached on (571) 272-1401. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Steve Weinstein/
Primary Examiner, Art Unit 1794

VS